

PROVINCE OF ALBERTA

THE BOILERS ACT, 1924



DEPARTMENT OF PUBLIC WORKS
BUREAU OF LABOR

*Regulations Governing
the
Examination of Engineers*

ISSUED UNDER ORDER IN COUNCIL NO. 1403
1924

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MINISTER OF PUBLIC WORKS AND LABOUR

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Regulations Relative to the Examination of Engineers

For the information of those concerned, the following is explanatory of certain provisions of The Boilers Act.

In accordance with Section 38, it is illegal for anyone to operate a boiler exceeding 2 horse-power, other than an engineer holding a certificate of qualification, if the boiler is governed by the Act and carries a maximum working pressure of 20 pounds or over. Section 40 prohibits an employer from allowing anyone to operate a boiler of the above mentioned class, other than an engineer who holds the proper certificate of qualification, or a permit under the Act.

Section 39 authorizes the issue of a 30-day permit to the owner of a boiler who furnishes an affidavit stating that he is unable by reason of some unforeseen occurrence to immediately secure the services of an engineer holding the proper certificate of qualification. The boiler may thereupon be operated by the person named in the affidavit, providing he produces satisfactory evidence of experience, good conduct, and sobriety.

The certificate or permit must be exposed in a conspicuous place, where possible, in addition to the registration certificate for the current year.

Section 50a (1). Every engineer and fireman (the holder of a fireman's final certificate) shall, during the continuance of his certificate, make application for re-registration on a form to be furnished by the Department, and remit the fee, together with the completed form, to the Department before the first day of January in each year.

Any engineer not complying with this provision shall not continue to operate under the certificate he holds; and, in the event of his so doing, it will constitute a breach of the Act, and render him liable to the penalty provided.

Section 56. A duplicate certificate may be issued by the Minister upon satisfactory proof (an affidavit) being furnished that the original certificate is lost or destroyed. One half the current fee is charged therefor. See paragraph 18.

Section 54. A certificate may be suspended by an Inspector, and cancelled by the Minister upon due cause being shown.

Section 50. The holder of a certificate issued under the provisions of any Act of Parliament within the British Empire may, upon application, be granted a certificate in lieu thereof, upon such evidence of qualification being submitted as may be required by the Minister.

Section 41. Certificates as follows are granted according to the qualifications of the applicant.

Section 49. The class of examination shall be determined by the Inspector: First Class, Second Class, Third Class, Traction Engineer's Final, Special, Firemen's Final, and Provisional.

REGULATIONS.

PARAGRAPH 1. Candidates for examination who have not previously held an Alberta Certificate must fill in a form of application. This form must be fully completed and submitted to the Inspector, together with the examination fees. Copies of certificates, testimonials, or references must also be submitted with the original documents, in support of their claim of qualification, before the examination can be proceeded with. The original documents referred to will thereupon be returned to the owner, if desired.

PARAGRAPH 2. All candidates must produce testimonials as to workshop time and experience, also as to service as engineers or firemen, such testimonials to be signed by their employer, in the case of workshop time, and by the employer or chief engineer in the case of engineers' or firemen's time. Testimonials as to workshop time must testify to the candidate's conduct and ability, and state what kind of work he was engaged in, and for how long. Testimonials as to service must testify to the applicant's sobriety, experience, ability, and general conduct for at least twelve months' service.

PARAGRAPH 3. When the workshop service has been performed in a place where steam boilers or engines are not made or repaired, and the class of work done is similar, the service may be accepted, with an additional year as engineer.

PARAGRAPH 4. In cases where testimonials from the employer or the chief engineer are not obtainable, the testimony of credible persons having a personal knowledge of the facts required to be established may be con-

sidered when included with their statutory declaration on the application form; the production, however, of such proofs, will not of necessity be deemed sufficient. Each case must be decided on its own merits.

PARAGRAPH 5. "Chief Engineer" means the engineer who has the control and direction of a steam plant in which more than one engineer is employed, and who holds a certificate under the Act of the class required to qualify him to take sole charge thereof.

PARAGRAPH 6. "Engineer in charge" means being in charge of a shift for at least 8 hours per day, and being responsible for the regulation of the feed water and the general supervision of the boilers and engines during such period.

PARAGRAPH 7. "Horse-power" means to have a capacity of 1 horse-power for each 12 square feet of the superficial heating surface of an externally fired boiler, and for each 9 square feet of an internally fired boiler.

PARAGRAPH 8. Examinations for engineers' certificates are held at each district inspector's headquarters on the first Saturday in each month, commencing promptly at 9 a.m., but candidates for First or Second Class Certificates will be directed by the Chief Inspector of Boilers, to whom written application must be made for permission to undertake examinations for either of these certificates not later than 21 days preceding the date of examination.

A candidate attending the examinations must provide the necessary pen and ink, pencils, drawing instruments and such equipment as is required for the

various grades of examination. He may use a copy of the Canadian Interprovincial Regulations, the Boilers Act, Logarithm and steam tables during the examination, but no reference to any other book or paper will be allowed.

PARAGRAPH 9. A candidate for a Fireman's Final Certificate shall be at least twenty years of age, and shall be granted a combined written and oral examination upon producing conclusive evidence of having had at least six months' experience as an engineer or fireman of a steam boiler; he must receive fifty per cent (50%) of the marks obtainable on the examination; he shall be allowed to have charge of a heating boiler only, not exceeding 15 horse-power, carrying a steam pressure of 20 pounds and not more than 100 pounds per square inch.

The examination consists of questions relating to the operation, maintenance, and proper care of a boiler; a description of at least one type of boiler; boiler fittings and heating plant equipment. The candidate may also be required to answer questions relating to a gravity return heating system; the principle of firing a boiler, etc.

PARAGRAPH 10. Any person of the full age of 18 years, who has had over 12 months' experience as an engineer or fireman outside the Province, or any person who has served for 12 months in the Province as fireman to the holder or holders of a final engineer's certificate, or has a certificate covering one year's course in power plant engineering issued by a duly recognized school of technology, and has, in addition, had six months' experience in the Province as a fireman under the holder or holders of a final engineer's certificate, may apply to

the Minister or an inspector for a provisional certificate of qualification for operation of boilers or engines not having a capacity of more than fifty horse power, and the Minister upon being satisfied that the applicant is a person of sufficient experience to justify the same, may cause the applicant to be orally examined by an inspector, and upon such applicant passing such examination satisfactorily he may be granted such provisional certificate, valid for a period of one year from the date of issue thereof.

A provisional certificate for a traction or portable boiler may be renewed upon recommendation of the inspector, without further examination being required.

A candidate for a provisional certificate must be able to answer the elementary questions verbally put to him by the inspector regarding the operation of the steam plant for which he required a certificate; he must understand the operation of an injector or a feed pump, or both; the safety valve, water gauge and other boiler and steam plant fittings; he must understand the importance of keeping boilers clean inside and out, also the principles of firing and the general care and running repairs of boilers and engines and their accessories.

PARAGRAPH 11. A candidate for a Traction Engineer's Final Certificate shall be at least 20 years of age; he must receive fifty per cent (50%) of the total marks obtainable, and he shall be allowed to have charge of and operate a traction boiler only. Providing he receives a minimum of 35% of the number of marks obtainable, he may be granted a provisional traction certificate and take charge of a traction boiler for a period of one year.

PARAGRAPH 12. A candidate for a Special Third Class Certificate limited to the operation of a railroad locomotive, steam shovel, hoisting or portable boiler, or for such special service shall be at least 20 years of age; he must receive fifty per cent (50%) of the total marks obtainable, and shall be allowed to have sole charge of a boiler or boilers of the description denoted on the certificate of a total capacity not exceeding 200 horse-power: Providing the candidate is orally examined for a Special Provisional Certificate, he shall, upon successfully passing the examination, be allowed to have sole charge of the boiler or boilers described in the certificate, having a total capacity not exceeding 50 horse-power, for a period of one year.

PARAGRAPH 13. A candidate for a Third Class Stationary Certificate shall be at least 20 years of age, shall furnish proof that he has served as fireman of a boiler or boilers for a period of 12 months; has had charge of and operated a boiler or boilers and has had charge of and operated an engine or engines for a further period of 12 months, or that he has served 12 months in a workshop employed on the manufacture or repairing of engines or boilers, and as fireman of a steam boiler for a further period of 12 months; or holds a certificate in steam engineering issued by a duly recognized school of technology and has served in charge of and operated a steam plant of the aforesaid capacity, for a period of six months, during which time he has held a provisional certificate or its equivalent under the Act. He must receive sixty per cent (60%) of the total marks obtainable on the examination paper he undertakes, and he shall be allowed to have sole charge of a

steam plant containing boilers not exceeding 200 horse-power, or he shall operate as engineer in charge of a shift in any steam plant containing boilers not exceeding 500 horse-power. Providing the candidate receives a minimum of fifty per cent (50%) of the total marks obtainable, he may be granted a Third Class Certificate, and shall be allowed to have sole charge of a steam plant containing boilers not exceeding a total capacity of 100 horse-power; or he shall operate as engineer in charge of a shift in a plant containing boilers of a total capacity not exceeding 200 horse-power; or, if deemed advisable, he may be allowed a Provisional Certificate for a period of one year.

The examination consists principally of questions relating to the maintenance and operation of the following:

Steam Boilers and Accessories. Description of boilers and fittings, boiler settings, elements of combustion; boiler room equipment such as pumps, etc.

Steam Engines. Details of engine parts, valve gears; valve settings; governors and flywheels, descriptive of modern engines and turbines, engine room auxiliaries, lubrication, foundations.

Refrigeration. Description of ammonia compression system, gauges, safety appliances, operation.

Electrical. D.C. and alternating dynamos and motors; switchboards; transformers and such equipment. Troubles, etc.

PARAGRAPH 14. A candidate for a Second Class Certificate shall be at least 22 years of age, and shall furnish proof that he has served four years in charge of and operated

a boiler or boilers, and had charge of and operated an engine or engines, of not less than 50 horse-power, or that he has served 24 months in a workshop employed in the manufacture of engines or boilers, and has served as engineer of a steam plant of not less than 75 horse-power for a period of at least 24 months or holds a two years' diploma in power plant engineering issued by a duly recognized school of technology, and in addition has served in charge of and operated a steam plant of at least 75 horse-power capacity for a period of not less than 36 months. A candidate must in any case have operated for at least six months as the holder of a full Third Class Certificate (200 horse-power), during the above mentioned periods.

A candidate for a Second Class Certificate must receive sixty per cent (60%) of the total marks obtainable on the examination paper he undertakes, and he shall, while holding such certificate, have sole charge of a steam plant containing boilers of a total capacity not exceeding 500 horse-power; or he shall operate as engineer in charge of a shift in any steam plant of which a First Class engineer is in direct charge. Providing the candidate receives a minimum of fifty per cent (50%) of the total marks obtainable he may be granted a Third Class Certificate (200 horse-power).

The examination consists principally of questions relating to the installation, operation, maintenance, and repairs of the following:

Steam Boilers and accessories. Construction; boiler room piping, valves and auxiliaries; boiler calculations; boiler settings; combustion; feed-water treatment.

Engines and Turbines. Air compressors; pumping engines and pumps; hoisting engines; valves and valve settings; indicator diagrams; governors and flywheels; condensers; air compressors; indicating; indicated horse-power calculations; lubrication; foundations, etc.

Refrigeration. Description of systems; safety appliances; operation, troubles, etc.

Electrical. Units, A.C. and D.C. machinery; switchboards; transmission; troubles.

Mathematics. Mensuration, arithmetic, material of construction; strength of simple structures.

PARAGRAPH 15. A candidate for a First Class Certificate shall be at least 25 years of age, shall furnish proof that he has been employed as a machinist or boilermaker on the repairing or building of steam engines or boilers for a period of not less than 24 months, and has had charge of a steam plant in which he operated a battery of boilers aggregating not less than 300 horse-power in capacity and that he has had charge of and operated engines aggregating not less than 300 horse-power in capacity, for a period of at least 12 months; or has operated a steam plant of the aforesaid capacity as Chief Engineer for a total period of five years, including six months in Alberta; or he must hold at least a two years' diploma issued by a duly recognized school of technology and, in addition, have operated a steam plant of the aforesaid capacity as Chief Engineer for a total period of four years, including six months in Alberta.

A candidate for a First Class Certificate must receive seventy per cent (70%) of the total marks obtainable on the examination

paper he undertakes; and he shall, while holding such certificate, be allowed to have sole charge of a steam plant containing boilers of any capacity.

The examination consists of questions relating principally to the maintenance and operation of the following:

Steam Boilers and boiler accessories; strength of boiler sheets, riveting, stays, etc., to comply with the Canadian Interprovincial Regulations; boiler room auxiliaries; boiler settings; automatic stokers; combustion; feed-water treatment; boiler tests, etc.; installation, maintenance and repairs, power plant piping.

Engines and Turbines. Modern power plant practice, air compressors and pumps, valves and valve diagrams; governors and flywheels; indicators and power brakes; lubrication and lubrication systems; engine repairs and tests; installation.

Refrigeration systems. Installation, operating; maintenance; repairs and testing, etc.

Electrical engineering. A.C. and D.C. generators and motors; transmission; switchboards; A.C. and D.C. machinery; operation troubles.

Mathematics. Mensuration; logarithms; materials of construction; strength of materials; foundations.

Thermodynamics. Theory of heat engines; application to boiler and efficiency tests.

PARAGRAPH 16. The diploma of efficiency referred to in these Regulations shall be approved by a board consisting of the Chief Inspectors under The Boilers Acts in effect

in the three Western Provinces of the Dominion of Canada, viz., British Columbia, Saskatchewan, and Alberta.

PARAGRAPH 17. In the event of a candidate failing to pass the examination for a First or Second Class examination he may not be examined again during a period of one year. A candidate for a Third Class or a Special Certificate may not be examined again for a period of six months.

The candidate shall in each case furnish proofs of three months' further service as an engineer from the date of failure, excepting that a candidate for a Traction Engineer's Final Certificate shall furnish proof of his having had at least one season's further practice as engineer.

FEES.

PARAGRAPH 18. The following examination fees must be paid to the Inspector examiner before the examination takes place. This fee will not be returned if the candidate fails to pass the examination:

First Class Engineer's Certificate	-	\$10.00
Second Class Engineer's Certificate	-	10.00
Third Class Engineer's Certificate	-	5.00
All other examinations	- - -	5.00
Renewal of Traction Provisional		
Certificates	- - - - -	5.00
Annual re-registration fees	- -	1.00

DUTIES AND LIABILITIES OF ENGINEERS.

PARAGRAPH 19. The Chief Engineer of a steam plant will be held accountable to the Department for the proper care and management of the boilers and machinery under his charge; he must report all accidents and

casualties to the inspector of the district; he shall also assist the inspector in making his examination of any boiler or boilers in his charge; he shall point out to him any defects he may know or believe to exist therein or in any other part of his plant, which would render it unsafe, as required by Section 14 of the Act; he shall likewise report the same to his employer.

PARAGRAPH 20. It is the duty of an engineer when he assumes charge of a steam plant to thoroughly examine the boilers and engines, steam piping, and all auxiliaries; and, if necessary, to report to the inspector.

PARAGRAPH 21. It is clearly the duty of an engineer or fireman to see, in the intervals between inspections, that all the safety valves release at the authorized working pressure allowed by the inspection certificate, and that other safety equipment, as well as the rest of the machinery, are in proper working order. There is no provision in The Boilers Act exempting him on the grounds that the steam plant has been inspected by a Government Inspector, from any liability to which he would otherwise be subjected.

